C-A OPERATIONS PROCEDURES MANUAL

11.4.8 Use of the STAR Magnet Interlock Key

Text Pages 2 through 4

Attachments

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: ***Signature on File*** _____
Collider-Accelerator Department Chairman Date

A. Etkin

11.4.8 Use of the STAR Magnet Interlock Key

1. Purpose:

1.1. This procedure describes the use of the magnetic interlock key switch for the STAR Magnet Power Supply System. It is intended to allow work to be performed inside of the magnetic field barriers at STAR without a LOTO of the STAR Magnet Power Supply System. Work performed utilizing this switch is limited to detector systems mounted on the outside of the magnet and specifically excludes any access to the magnet electrical or water systems.

2. Responsibilities:

2.1. It is the responsibility of workers wishing to work inside of the STAR magnetic field barriers contact the STAR Work Control Coordinator/STAR Shift Leader and receive authorization

2.2. It is the responsibility of the STAR Work Control Coordinator/STAR Shift Leader to insure that only trained and authorized personnel are permitted to work inside the STAR magnetic field barriers utilizing the STAR Magnet Interlock Key.

2.3. It is the responsibility of the STAR Work Control Coordinator/STAR Shift Leader to insure that prior to enabling the STAR magnet power supplies all tools have been removed from the area and the STAR magnetic barriers have been restored to their normal state.

3. Prerequisites:

3.1. Authorized personnel shall be up-to-date in their training for user access to C-A facilities and STAR Hazard Awareness Training. Additional job specific training may be required such as portable ladder safety, Scaffold User Safety, Fall Protection Equipment-specific Training, and Aerial Lift Training.

4. Precautions:

4.1. Work performed utilizing this switch is limited to detector systems mounted on the outside of the magnet and **specifically excludes any access to the magnet electrical or water systems**.

4.2. Access by personnel with electronic medical implant devices such as pacemakers is not permitted utilizing the STAR magnet interlock key. **LOTO** of the magnet power supplies is required for such access.

4.3. Access beyond the barriers to the upper half of the magnet requires that all hand tools be equipped and tethered using wrist lanyards. Precautions must be taken not to drop equipment and hardware into the magnet. Notify the STAR shift leader immediately if this were to occur.

4.4. Prior to use of STAR magnet interlock key all STAR magnet power supplies are to be ramped down to zero current and put in the standby state.

5. Procedures:

5.1. Upon request the STAR Work Control Coordinator/STAR Shift Leader shall review and approve requests to work inside of the magnetic field barriers.

> **Note:**
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> The STAR magnet interlock key switch is located in the STAR control room atop the magnet control console. With the key switch in the **Enable** position the key is captive and allows all power supplies to be reset in standby and ready to be turned on. With the key switch in the **Disable** position it is removable and interlocks the main and pole tip power supplies to the standby state and the space trim power supplies in the off state.

5.2. The STAR Work Control Coordinator/STAR Shift Leader shall ramp the STAR magnet power supplies to zero current and puts them in the standby state.

5.3. The STAR Work Control Coordinator/STAR Shift Leader turns the magnet interlock key switch to the **Disable** position and removes the key from the switch.

> **Warning:**
>
> This magnetic interlock is for work only on detector systems mounted outside the magnet. Work on Magnet systems requires **LOTO** of the applicable magnet systems

5.4. The STAR Work Control Coordinator/STAR Shift Leader shall retain control of the magnet interlock key.

5.5. The STAR Work Control Coordinator/STAR Shift Leader shall authorize removal of the magnetic field barriers and access to the detector for the approved jobs.

> **Caution:**
>
> Access atop the magnet requires the use of tethered tools or wrist lanyards to prevent them from falling into the magnet. Inform the STAR Shift leader if any equipment has fallen into the magnet.

5.6. If any equipment is dropped into the STAR magnet the STAR Work Control Coordinator/STAR Shift Leader shall have the magnet power supply system **LOTO'ed** and contact the STAR Liaison Engineer.

5.7. When all jobs are completed the STAR Work Control Coordinator/STAR Shift Leader shall verify that the area has been sweep for tools, equipment, personnel and that the magnet barriers and signs have been properly replaced.

5.8. The STAR Work Control Coordinator/STAR Shift Leader shall use the magnetic interlock key to enable the STAR magnet power supply system.

6. Documentation:

6.1 None

7. References:

7.1 STAR Magnet Disable Key Switch; Pablo Rosas, February 3, 2006.

8. Attachments:

8.1 STAR Magnet Disable Key Switch; Pablo Rosas, February 3, 2006.

Attachment:

February 3, 2006
P. Rosas

STAR MAGNET DISABLE KEY SWITCH

The STAR Magnet disable key installed last year in the STAR Control Room was tested, but not implemented. The function of the key switch is to interlock all five power supplies connected to the STAR magnet. The key switch has two functions **Disable** and **Enable**.

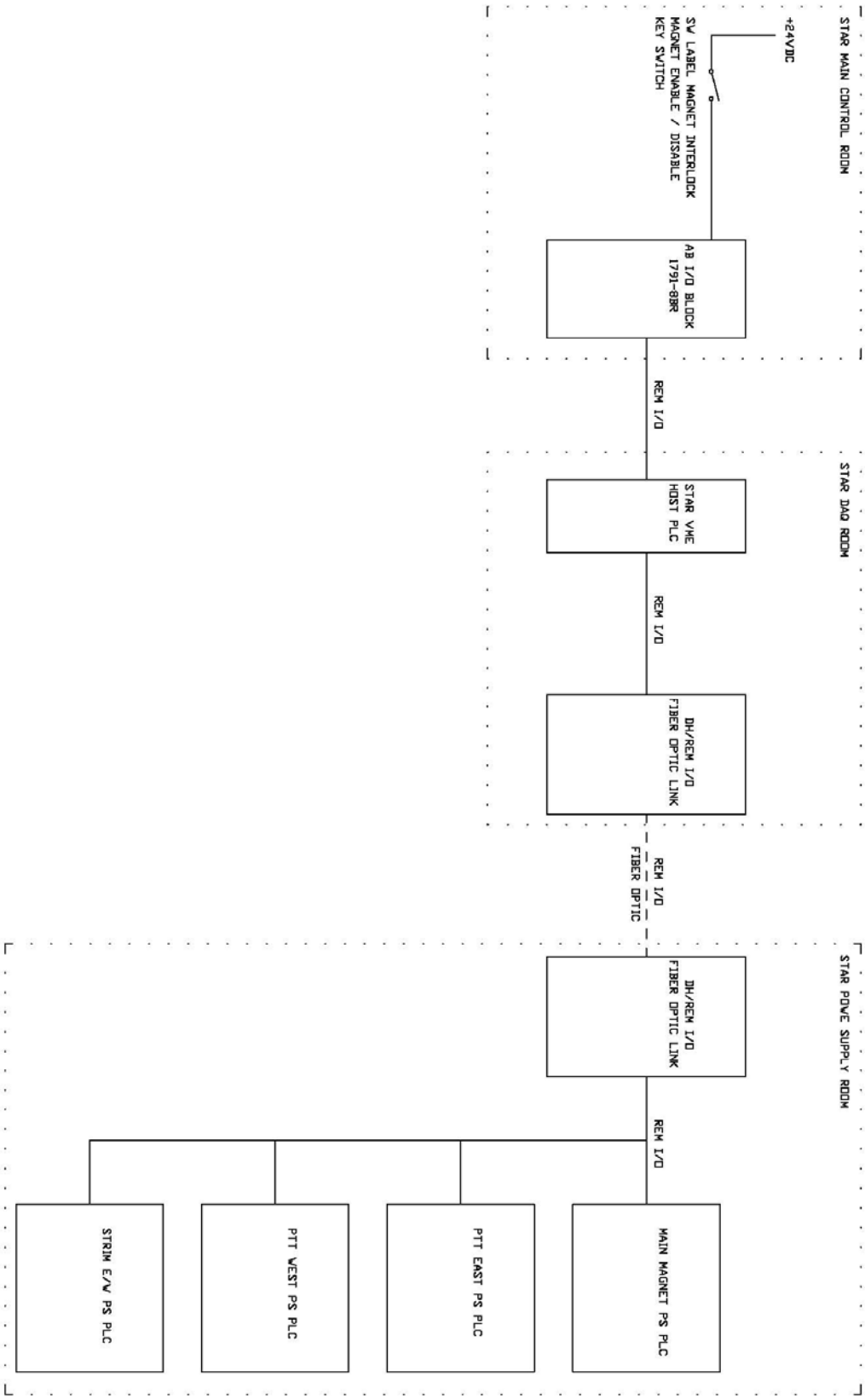
Key switch in Disable position (Key is remove) – Interlocks the main and pole tip power supplies to the standby state and the space trim power supplies in the off state.

Key switch in **Enable** position (Key is captive) – Allows the main and pole tip power supplies to be reset in standby and ready to be turn on. The space trim power supplies must be brought to the standby state using the pet page prior to using the experimenter program to continue the turn on sequence.

The Magnet disable key is only to be used in the Standby State to interlock all five power supplies, in the **Standby State** once the interlock is received through the PLC software a slow-run down & trip interlock is generated in the Main Magnet, PTT East and PTT West power supplies and a fault state in both of the Space Trim Inver power supplies, causing all power supplies to remain in the Standby State with an interlock fault state. Once the key is **Enabled** a reset can then be sent to the main and pole tip power supplies to clear the interlocks and be ready for turn on. The pet page must be used inoder to clear the interlocks for the space trim power supply to make the ready for turn them on.

The slow – run down & trip interlock will not cause the 86 Lock out Relay to be energized and would not require the CAS watch to be called.

On State - Should an operator turn the Magnet disable key to **Disable** while the power supplies are in the On state and at full output, the slow-run down & trip interlock is generated and the Main Magnet, PTT East and PTT West begin to ramp down to zero current and after three minutes the three power supplies turn to the Standby fault state. The Space Trim Inver power supplies will trip instantly after receiving the interlock.


STAR MAIN CONTROL ROOM
+24VDC
SW LABEL MAGNET INTERLOCK
MAGNET ENABLE / DISABLE
KEY SWITCH
AB I/O BLOCK
1791-8BR
REM I/O
STAR DAQ ROOM
STAR VME
HOST PLC
REM I/O
DH/REM I/O
FIBER OPTIC LINK
REM I/O
FIBER OPTIC
STAR POWE SUPPLY ROOM
DH/REM I/O
FIBER OPTIC LINK
REM I/O
STRIM E/W PS PLC
PTT WEST PS PLC
PTT EAST PS PLC
MAIN MAGNET PS PLC